DISEASE PATTERNS OF THE HOMELESS IN TOKYO

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ABSTRACT   In recent years, homelessness has been recognized as a growing urban social problem in various countries throughout the world. The health problems of the homeless are considerable. The purpose of this study was to elicit, with sociodemographic profiles, the disease patterns among Tokyo's homeless. The subjects were 1,938 men who stayed at a welfare institution from 1992 to 1996. Diagnosed diseases/injuries and sociodemographic profiles were analyzed. The disease patterns of the homeless were compared to those of the male general population. Of the subjects, 8.3% were admitted to the hospital; 64.0% received outpatient care. Their observed morbidity rates by disease category were greater than those of the male general population in both Japan and Tokyo. Comorbidity of alcoholic psychosis/alcohol-dependent syndrome to both liver disease and pulmonary tuberculosis were greater than the average ($P < .01$). Construction work brought a higher risk of pulmonary tuberculosis (odds ratio = 2.0) and dorsopathies (odds ratio = 1.4) than did other jobs ($P < .05$). Disease patterns among the homeless in Tokyo were characterized by alcoholic psychosis/alcohol-dependence syndrome; liver disease; pulmonary tuberculosis; diabetes mellitus; fractures, dislocations, sprains, strains; hypertension; and cerebrovascular disease. Although the sociodemographic backgrounds of Tokyo's homeless have become more diverse, the principal occupation of the homeless was unskilled daily construction work, which underlay the characteristics of their disease patterns.

KEY WORDS   Disease Pattern, Homeless, Residential Instability.

INTRODUCTION

In recent years, homelessness has been recognized as a growing urban social problem in various countries throughout the world. We believe it is essential to exchange research work from different countries on a common platform.

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A recent report by the Tokyo Metropolitan Government has estimated that approximately 3,300 people are living in open public places, including streets, parks, railway stations, and riverbeds in the metropolitan area.[1] The census in 1995 revealed that the number of people in Tokyo who did not have a place to live or whose place of residence was unknown was 9,898.[2] The number of homeless living in open places in Tokyo is increasing rapidly; for instance, the number increased 2.5 times from 1993 to 1994.[1] Most homeless (94%) are male.[3] Homeless people have now dispersed throughout the metropolitan area, becoming more visible than at any time since the restoration era after World War II.

The health problems of the homeless are considerable. The most recent interview survey of homeless people in Tokyo revealed that 33.9% of them described their health status as "poor"; 57% described their health as "fair"; only 7.4% described their health as "good."[4] However, there has not been a systematic study, using sociodemographic profiles, of the disease patterns of Tokyo's homeless.

In the present study, we conducted a survey of 1,938 male homeless individuals who use an institution that has a legal basis through the Welfare Protection Law and provides male homeless with beds and everyday goods for their protection; we elicited the salient features of sociodemographic profiles and disease patterns. However, because this survey was in the nature of a shelter study, there are certain limitations.

METHODS

SUBJECTS

Ichiji-hogo-soudan-syo is an institution operated by the Human and Health Affairs Union of the city-wards of the Tokyo Metropolis. It serves men who do not have customary and regular access to a conventional dwelling and need to be protected because of physical and/or mental problems. It has a facility with 100 beds and equipment for daily life, although the entrants' residency in this institution is treated as nonpermanent. The subjects of the present study (1,938 men) were all the entrants who stayed at the institution during the 5 years from April 1, 1992, to March 31, 1996. Every entrant visited the hospital with a social worker after his entry to the institution regardless of whether he was hospitalized previously or not. Therefore, all entrants, including healthy clients, were examined by physicians when they entered the institution. The result of the health examination was written in the entrant's record.

CODING OF SOCIODEMOGRAPHIC PROFILES, DISEASE, AND INJURIES

Age, place of birth by prefecture, year of entry, duration of stay in the institution, marital history, education, type of work engaged in for the longest period, occupa-

tion for the longest period, type of work before receiving welfare assistance, occupation before receiving welfare assistance, number of times applied for and received welfare assistance, type of dwelling before receiving welfare assistance, where living before entering the institution, reason for entry, reason for discharge, treatment at discharge, and type of dwelling after discharge were all coded on the basis of a personal interview and record by professionally trained social workers from the institution.

Current medical problems were diagnosed when entrants visited the hospital with social workers from the institution. There, all entrants, including healthy clients, were examined by physicians and diagnoses were made. Treatment was provided in an outpatient setting for those in need of clinical care; if entrants were assessed to be in need of inpatient medical treatment, they left the institution and were admitted to the hospital. Diagnosed diseases and injuries were compiled individually according to the coding of the ninth version of the International Classification of Diseases and Injuries (ICD-9).

STATISTICAL ANALYSIS

Observed morbidity rates of the subjects by disease categories were calculated per thousand entrants, as was the number of people diagnosed with a specific disease or injury. To ascertain whether these observed morbidity rates are higher than the morbidity rates of the male general population in Japan, we calculated age-adjusted expected morbidity rates per thousand population using the estimated total number of male patients in Japan based on the *Patient Survey 1993*[5] and adjusting for the age distribution of the subject population. Other age-adjusted expected morbidity rates were calculated using the estimated total number of male patients in Tokyo and adjusting for the age distribution of the subject population.

The prevalence of individual disease categories was calculated as a percentage of the target disease category among the total identified disease categories. The change in this percentage according to the year of entry was tested by applying the logit model and the probit model.

Comorbidity of diseases was calculated as the percentage of patients diagnosed with selected diseases among patients diagnosed with specific diseases. Unequal distribution of comorbidity was tested by comparing distribution among all the diagnosed diseases and injuries and by statistically examining the significance of Cramer V statistics.

To identify groups of disease categories among the studied population, factor analysis and hierarchical cluster analysis using single linkage algorithms were

performed. The existence of each disease/injury was scored individually, and the scores for all entrants suffering from at least one disease/injury were used for calculation.

To elucidate sociodemographic characteristics influencing disease patterns, odds ratios and their 95% confidence intervals for selected sociodemographic characteristics in comparison to reference characteristics were calculated for individual selected disease categories.

RESULTS

SOCIODEMOGRAPHIC PROFILE

Sociodemographic profiles of the entrants are summarized in Table I. Of the 1,938 entrants, 97.2% were identified as literally homeless; the rest were housed precariously and could be called homeless if a slightly broader definition was applied.[6] None of them had jobs when they were admitted to the institution. In terms of years of education, as shown in Table I, completion of compulsory education means 9 years of schooling; completion of high school education means 12 years. The percentage of university graduates among the entrants doubled from 2.0% in fiscal year 1992 to 4.1% in fiscal year 1996.

Regarding the former occupation in which the entrants had been involved for the longest period in the past, 49.6% of the occupations fell into the category of construction, manufacturing, and other laboring work. Among those, people involved in construction work numbered 732, and that represented the greatest portion (37.8%).

The entrants in the category "no dwelling after discharge from hospital" in Table I were individuals who were either admitted to the hospital while homeless or who lost their dwellings while in hospital due to residential instability. Temporary winter accommodations are provisional lodgings temporally constructed in three places in the metropolitan area from December to March for homeless people.

Among the 1,938 entrants, 8.3% were admitted to the hospital for inpatient care; 64.0% were given outpatient care at the hospital during their stay at the institution. Of those diagnosed with at least one disease or injury, 95% were managed by outpatient medical care. The average duration of stay at the institution was 12.7 ± 9.2 weeks (mean ± standard deviation [SD]). After discharge, 55.7% entered long-term accommodations for rehabilitation, 3.8% were admitted to other welfare facilities, and 17.9% left the institution for reasons such as unlawful acts, drinking alcohol, or of their own free will.

TABLE I Sociodemographic Profile of Subjects (n = 1,938)

	Percentage		Percentage
Age		Marital status*	
20–29	0.3	Previously married	42.1
30–39	2.4	Separated	(2.3)†
40–49	17.6	Divorced	(88.8)†
50–59	38.6	Widowed	(7.4)†
60–69	32.9	Never married	44.0
70+	8.2	Unknown	13.9
Place of birth		Former occupational experience‡	
Tokyo	20.2	None	4.1
Kanto (excluding Tokyo)	17.4	Manufacturing, construction, and other	49.6
Hokkaido-Tohoku	23.2	laborers	
Chubu	9.1	Craftsmen	14.9
Kinki-Chugoku-Shikoku	7.3	Service workers	7.9
Kyushu-Okinawa	7.2	Skilled engineers	5.4
Other	3.0	Clerical workers	4.0
Unknown	12.7	Vagrancy service workers	1.3
Education		Agriculture, forestry, fisheries	0.7
None	0.2	Self-employed, employers	2.1
Did not complete compulsory	5.2	Government workers	1.3
education		Other	2.7
Compulsory education	61.2	Unknown	5.9
High school education	17.0	Place living before entering the institution	
College or university	2.5	Hospital	32.6
Other	0.5	Temporary winter accommodations	45.8
Unknown	13.5	Other places	12.3
Place where highest educational		No accommodation	9.1
level was completed		Unknown	0.2
Tokyo	22.2	Reason for entry	
Kanto (excluding Tokyo)	17.5	No dwelling after discharge from hospital	39.8
Hokkaido-Tohoku	22.5	No dwelling	57.4
Chubu	9.2	Other reasons	2.8
Kinki-Chugoku-Shikoku	6.8	Health status	
Kyushu-Okinawa	7.6	Suffering from one or more diseases/injuries	75.7
Other	1.2	Without notable diseases/injuries	23.9
Unknown	13.0	Unknown	0.4

*All individuals should be recognized as not being married at the time of entry.

†Percentage of all those previously married.

‡Type of occupation in which subjects were involved for the longest in the past. No one was working at the time of admission.

DISEASE PATTERNS

The disease patterns of entrants are shown in Table II; in comparison with the male general population in Japan, the patterns indicated a high prevalence of illness and a salient proportion of diseases. This high prevalence was observed similarly when expected morbidity was calculated using morbidity data from the entire male population of Tokyo.

The following two disease categories showed statistically different proportions among the total identified number of disease categories by year: alcoholic psychoses/alcohol-dependence syndrome and cerebrovascular disease. The former increased from 1.2% in fiscal year 1992 to 6.3% in fiscal year 1996; this increase was statistically significant ($P < .05$). In contrast, the latter decreased from 10.2% in fiscal year 1992 to 3.8% in fiscal year 1996, and this decrease was also statistically significant ($P < .05$).

Of the 1,938 entrants, 738 had two or more diseases. Comorbidity of alcohol psychoses/alcohol-dependence syndrome with liver disease was 28%, higher statistically than the average ($P < .01$). Comorbidity with cirrhosis of the liver

TABLE II Observed and Age-Adjusted Expected Morbidity Rates of the Subjects by Selected Disease Categories

Disease Categories	ICD-9 Code	Morbidity (Per 1,000)	
		Observed*	Expected†
Mental disorders	290–319	86.7	14.4
Alcoholic psychoses, alcohol-dependence syndrome	291, 303	57.8	1.1
Hypertensive disease	401–405	149.6	89.6
Ischemic heart disease	410–414	15.5	15.5
Cerebrovascular disease	430–438	64.5	21.2
Diabetes mellitus	250	98.6	29.9
Pulmonary tuberculosis	011	38.7	1.6
Gastric and duodenal ulcer	531–533	60.4	21.3
Cirrhosis of liver, biliary cirrhosis, chronic hepatitis	571.2, 571.5, 571.6, 571.4	96.5	10.4
Chronic hepatitis	571.4	62.4	7.7
Cirrhosis of liver, biliary cirrhosis	571.2, 571.5, 571.6	37.2	2.7
Dorsopathies‡	720–724.9 (excluding 723.3, 724.3)	89.3	17.5
Fractures, dislocations, sprains, and strains	800–848	29.9	5.4
Cataract	366	23.7	10.1
Diseases of the skin and subcutaneous tissue	680–709	26.3	11.6
Diseases of the genitourinary system	580–629	23.2	13.8
Malignant neoplasms	140–208	29.4	15.1

*Number of patients among the subjects calculated as per thousand of the subject population.

†Expected morbidity was calculated as the expected number of patients per thousand population using the estimated total number of male patients in Japan (*Patient Survey in 1993*)[5] and adjusting for the age distribution of the subjects.

‡This category includes all dorsopathies other than cervicobrachial syndrome and sciatica.

was 13%; with diabetes mellitus, comorbidity was 13%. Comorbidity of diabetes mellitus with alcohol psychoses/alcohol-dependence syndrome was significantly higher for those aged 49 and younger than the distribution in the total number of diagnosed diseases for the same age group ($P < .05$). Statistically greater comorbidities were also shown for diabetes mellitus with pulmonary tuberculosis ($P < .01$), hypertension with cerebrovascular disease ($P < .01$), and diabetes mellitus with cataract ($P < .01$).

On the other hand, statistically smaller comorbidities were shown for hypertension with alcoholic psychoses/alcohol-dependence syndrome ($P < .01$); pulmonary tuberculosis with hypertension ($P < .01$); liver disease with cerebrovascular disease ($P < .05$); gastric ulcer with hypertension ($P < .01$); fractures, dislocations, sprains, strains with hypertension ($P < .05$); fractures, dislocations, sprains, strains with cerebrovascular disease ($P < .05$); and fractures, dislocations, sprains, and strains with diabetes mellitus ($P < .05$).

Both the estimated factor loadings of factors with an eigenvalue greater than 1.0 and the results of the hierarchical cluster analysis showed the following associations in the studied disease categories: hypertensive disease and cerebrovascular disease, and alcoholic psychoses/alcohol-dependence syndrome and cirrhosis of liver/biliary cirrhosis/chronic hepatitis.

Those having received welfare assistance two or more times previously were more likely to have alcoholic psychoses/alcohol-dependence syndrome (odds ratio [OR] = 3.7), liver disease (OR = 2.3), mental disorders (OR = 2.1), and dorsopathies (OR = 1.7) than those with no experience receiving welfare assistance ($P < .05$).

Working in construction brought with it a higher risk of pulmonary tuberculosis (OR = 2.0) and dorsopathies (OR = 1.4) than other jobs ($P < .05$).

DISCUSSION

When comparing the age characteristics of our data with data from homeless people living on the street,[2,3] it was noted that the individuals who were the source of the present data were slightly older, which, it was thought, was due to the fact that the institution was open for the protection not only of the street homeless, but also the homeless in other situations. The age distribution of the street homeless previously reported was as follows: under 30, 1.7%; 30–39, 5.9%; 40–49, 27.3%; 50–59, 39.1%; 60–69, 21.9%; 70 and over, 3.4%[2]; and the age distribution for the same age groups was 1.5%, 4.1%, 25.0%, 38.6%, 25.7%, and 3.2%, respectively, in another survey.[3] The homeless population in Tokyo was inferred generally to be older than that in the US, based on comparisons with various

reports on American homelessness: the average age of the homeless was 40 years[6]; two-thirds were between the ages of 25 and 44 (the average age was 36 years)[7]; two-thirds were under 40 (the average age was 37)[8]; 60.9% were under 44[9]; 64% were 35 or under[10]; and the mean age was 34.5.[11] There were proportionately fewer of the very young and the old,[6] which was similar to US data if "old" means over 70, in the Tokyo study. One of the reasons for the low proportion of elderly homeless people in Tokyo was thought to be the several welfare services available to the elderly. In fact, the entrants over age 70 at the institution were accepted by a nursing home for the elderly. Another reason, of course, might be a high mortality rate for the homeless.[12]

The education level among the entrants was lower compared to the male adult general population in Tokyo, of which over 78% were current graduates of at least high school.[13] However, there seems to have been an increase in the diversity of the educational level. Occupational experiences were characterized principally by unskilled daily construction work, which can be seen as one of the salient background characteristics of homeless people in Tokyo at the present time. Collapse of the bubble economy and an increase in foreign workers have been identified as causes of the accelerating unemployment among construction workers.[14]

Concerning the high prevalence of disease in the present population, it should be kept in mind that the institution by its very nature tends to be used by physically and/or mentally weaker people, which might result in the higher prevalence of disease compared to the homeless who do not use the institution. That notwithstanding, the patterns of disease represented some core problems that the homeless face. There was a markedly higher prevalence of certain diseases among the present homeless population than among the male general population in Tokyo. While the entrants showed higher morbidity than the general population in every category of the leading diseases, morbidity was at least three times as high for alcoholic psychoses/alcohol-dependence syndrome; cerebrovascular disease, diabetes mellitus; pulmonary tuberculosis; chronic hepatitis; cirrhosis of liver/biliary cirrhosis, dorsopathies; and fractures, dislocations, sprains, and strains.

Mental disorders were proportionately high, which was a reflection of the high prevalence of alcoholic psychoses/alcohol-dependence syndrome. The proportion of mental illness unrelated to alcoholism was relatively low among the entrants, although mental illness affecting alcoholics remained unclear in our data. Present data on mental disorders may well underestimate the percentage of mental illness among the homeless population in Tokyo since it has been

reported that 15% of all cases, regardless of whether they are homeless or not, sent from city-ward welfare offices to the judgment committee that decides the most appropriate program for protection and aid involve individuals with mental illness.[15] That notwithstanding, the proportion of mental disorders appeared to be smaller among the homeless population of Tokyo than the homeless population of the US when compared with some of the figures that have been reported.[6,7,9,16] However, the comparison between two countries should be seen as tentative because there is a difference in the policy for deinstitutionalization.[17] Further comparative studies are necessary.

Alcoholic psychoses/alcohol-dependence syndrome was a notable characteristic of the disease patterns among the homeless population in the present study. Alcohol abuse among the homeless has been pointed out in many studies.[7,16,18] A high rate of comorbidity with liver disease and diabetes mellitus was shown in the present study. A report on patients in an alcohol rehabilitation program at the National Institute of Alcoholism Kurihama Hospital indicated that 14.2% of the patients had cirrhosis of the liver and 15.7% had diabetes mellitus.[19] These percentages of comorbidity were similar or somewhat higher compared to the corresponding values in the present data, indicating that no additional risk factor was seen to be increasing the complication of cirrhosis of the liver or diabetes mellitus with alcoholics in the present subjects. The expected morbidity of alcoholic psychoses/alcohol-dependence syndrome in the general population was based on the number of cases receiving medical treatment; the actual figure was assumed to be higher than the present figure, since there must have been cases not receiving medical treatment, as inferred from the estimated size of the male population who are problem drinkers (7%) or have a serious drinking problem (3%).[20] Even considering this point, however, the large difference in the morbidity rate of alcohol psychoses/alcohol-dependence syndrome between the subject population and the general population cannot be denied.

The mortality from pulmonary tuberculosis is generally high in Japan compared to the US.[21] Pulmonary tuberculosis infection among the homeless has been found in Japan[22–24] to be as serious as in the US.[11,25–28] The proportion of tuberculosis in the present data was convincingly high compared to the general population. There was a tendency of not completing medical treatment, a failing that is known widely to be a key component of the vicious cycle of tuberculosis prevalence among the homeless population.[23,24,27,28] It was noted that the entrants who had an occupational history as construction workers were more likely to have tuberculosis, which implied that the crowded living conditions of daily employed construction workers, at bunkhouses or boarding lodges, might have

been one of the factors in higher tuberculosis transmission. There is little informa-
tion about comorbidity of acquired immunodeficiency syndrome and tuberculo-
sis among the homeless in Japan, but according to a previous study, no case has
yet been reported.[23] The percentage of drug-resistant cases who were admitted
and treated for active tuberculosis at the Nakano National Chest Hospital from
1993 to 1994 was 21.5%; from 1986 to 1988 it was 5.1%.[24] Given these facts, follow-
up care to the entrants should be stressed more.

The reason for the high prevalence of diabetes mellitus remained unclear in
the present study. However, diabetes mellitus could have a significant linkage
to alcoholic psychoses/alcohol-dependence syndrome and to tuberculosis. This
implied that excessive drinking and inadequate nutrition due to unbalanced food
intake underlaid the onset and aggravation of diabetes mellitus, and together
they led to the additional risk of tuberculosis infection. Homeless people often
scavenge leftover rice and fast food or abandoned foods from restaurants. They
take relatively many carbohydrates and fats as a result, which causes their unbal-
anced food intake. Overweight was not a statistically significant feature in the
present data of the subjects affected with diabetes mellitus.

Fractures, dislocations, sprains, and strains related to construction work were
recognized as another salient feature of the present population of homeless in
Tokyo. These disorders had less linkage to other diseases, such as diabetes
mellitus, hypertension, and cerebrovascular disease. Considering the large pro-
portion of former construction workers among the homeless, it seems that their
working conditions and working environment put them at high risk for injury,
and that once injured they became unemployed, as disability reduced their
work opportunities. There were, of course, entrants who had complex problems
involving fractures, dislocations, sprains, and strains and alcoholic psychoses/
alcohol-dependence syndrome.

Hypertension was a dominant disease that emerged from the present morbid-
ity data. It had a close linkage to cerebrovascular disease. However, this disease
group was less relevant to the linkage between alcoholic psychoses/alcohol-
dependence syndrome and pulmonary tuberculosis. Hypertension was also dom-
inant in the disease patterns among the male general population in Tokyo.
Cerebrovascular disease, which is one of the leading causes of death in the Kanto
region and is more prevalent in Tohoku, the area north of Tokyo, has been
correlated with disadvantaged socioeconomic status.[29] This was consistent with
the fact that most construction workers in the present population came from
Kanto or Tohoku.

In conclusion, disease patterns among the homeless in Tokyo were character-

ized by alcoholic psychoses/alcohol-dependence syndrome, liver disease, pulmonary tuberculosis, diabetes mellitus, fractures, dislocations, sprains, strains, hypertension, and cerebrovascular disease. The analysis of comorbidity showed a linkage of alcoholic psychoses/alcohol-dependence syndrome to both diabetes mellitus and pulmonary tuberculosis. Although the diversity of the sociodemographic backgrounds of the homeless in Tokyo increased, the occupational experiences of the homeless were characterized principally by unskilled daily construction work, which underlaid the characteristics of the disease patterns.

ACKNOWLEDGEMENTS

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